**IN THE CLAIMS**

Please cancel claims 1-10 without prejudice or disclaimer, and substitute new claims 11-20 therefor as follows:

Claims 1-10 (Cancelled).

11. (New) A method of determining characteristic spin parameters of a spun optical fiber, comprising:

performing optical time-domain reflectometry measurements on the fiber, so as to obtain a state of polarization (SOP) spatial function from a backscattered electromagnetic field, said SOP spatial function being defined by a plurality of components; and

processing the SOP spatial function by:

calculating a further spatial function related to the spatial first derivative of at least one of said components of the SOP spatial function;

identifying a spatial periodicity of said further spatial function; and

determining said characteristic spin parameters as a function of said spatial periodicity.

12. (New) The method according to claim 11, in which said characteristic spin parameters comprise at least one of a spin inversion period and a spin period.

13. (New) The method according to claim 12, in which said further spatial function is a birefringence modulus.

14. (New) The method according to claim 13, in which said determining the characteristic spin parameters comprises locating peaks in the birefringence modulus, and determining the spin inversion period based on a distance between the peaks.

15. (New) The method according to claim 13, further comprising:

calculating a spectrum of the birefringence modulus;

analyzing the calculated spectrum to locate at least one spike; and

determining the spin inversion period based on spatial frequency of the spike.

16. (New) The method according to claim 15, in which said spectrum is calculated in correspondence of a measurement window of optical fiber length of prescribed width, the method further comprising:

causing the measurement window to shift along the fiber.

17. (New) The method according to claim 11, in which said performing optical time-domain reflectometry measurements on the fiber and calculating a further spatial function related to the spatial first derivative of at least one of said components of the SOP spatial function is repeated at least once after changing the fiber conditions.

18. (New) The method according to claim 16, in which said changing the fiber conditions comprises one or more among changing a fiber end at which the optical time domain reflectometry measurements are performed, vibrating the fiber, causing the fiber temperature to vary, waiting a time before repeating the measurements.

19. (New) An apparatus for determining characteristic spin parameters of a spun optical fiber, comprising:

a source of electromagnetic radiation optically coupled to the fiber;

a POTDR measurement apparatus optically coupled to the fiber to obtain a state of polarization (SOP) spatial function from a backscattered electromagnetic field, said SOP spatial function being defined by a plurality of components; and

a data processor for processing the SOP spatial function,

wherein the data processor is adapted to:

calculate a further spatial function related to the spatial first derivative of at least one of said components of the SOP spatial function;

identify a spatial periodicity of said further spatial function; and

determine said characteristic spin parameters as a function of said spatial periodicity.

20. (New) The apparatus according to claim 19, in which said further spatial function is a birefringence modulus.